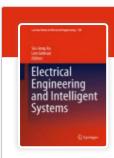
## **SPRINGER LINK**

— Menu

Search

**◯** Cart



Electrical Engineering and Intelligent Systems pp 239-248

<u>Home</u> > <u>Electrical Engineering and Intelligent Systems</u> > Chapter

## Computations of Price Sensitivities After a Financial Market Crash

Chapter | First Online: 01 January 2012

**1677** Accesses 4 Citations

Part of the book series: <u>Lecture Notes in Electrical</u> <u>Engineering</u> ((LNEE,volume 130))

#### Abstract

Several new approaches have been recently suggested in the literature for the computation of the price sensitivities of financial assets. However, there is lack of studies that investigate this issue during financial crises. It is a well-known fact that the volatility increases significantly during financial crises. This increased volatility is naturally going to affect the underlying option pricing, the price sensitivities and consequently the management of the underlying risk. It is especially during the crises that the investors require to have access to precise calculations in

order to deal with the increased level of risk. This issue is especially relevant due to the globalization. Thus, to compute the price sensitivities in such a scenario is crucial. This paper is the first attempt to the best knowledge to address the computation of price sensitivities after a financial market crash occurs. Our method to tackle the problem is based on Malliavin calculus.

This is a preview of subscription content, <u>log in via</u> an institution.

Chapter
 Price includes VAT (Poland)
 Available as PDF
 Read on any device
 Instant download

#### **Buy Chapter**

Price includes VAT (Poland)

- Available as EPUB and PDF
- · Read on any device
- · Instant download
- Own it forever

Own it forever

### Buy eBook

▼ Softcover Book

EUR 106.99

Price includes VAT (Poland)

- · Compact, lightweight edition
- · Dispatched in 3 to 5 business days
- Free shipping worldwide see info

#### **Buy Softcover Book**

→ Hardcover Book

EUR 106.99

Price includes VAT (Poland)

- Durable hardcover edition
- Dispatched in 3 to 5 business days
- Free shipping worldwide see info

#### Buy Hardcover Book

Tax calculation will be finalised at checkout

#### Purchases are for personal use only

Learn about institutional subscriptions

#### References

- 1 Black F, Scholes M (1973) The pricing of options and corporate liabilities. J Polit Econ 81:637–654
- 2 Deeba E, Dibeh G, Xie S (2002) An algorithm for solving bond pricing problem. Appl Math Comput 128(1):81–94
- 3 Baillie RT, Dibeh G, Chahda G (2005) Option pricing in markets with noisy cyclical and crash dynamics. Finance Lett 3(2):25–32
- 4 Dibeh G, Harmanani HM (2007) Option pricing during post-crash relaxation times. Phys A 380:357–365
- 5 El-Khatib Y, Hatemi-JA (2011a) On the price sensitivities during financial crisis. In:

Proceedings of the world congress on engineering 2011. Lecture notes in engineering and computer science, WCE 2011, London, U.K., 6–8 July 2011, pp 401–404

- 6 El-Khatib Y, Hatemi-JA (2011b) On the calculation of price sensitivities with jump-diffusion structure. MPRA Paper 30596.
  University Library of Munich, Germany
- 7 El-Khatib Y, Privault N (2004) Computations of greeks in a market with jumps via the Malliavin calculus. Finance Stoch 8(2):161–179
- 8 Forbes KJ, Rigobon R (2002) No contagion, only interdependence: measuring stock market comovements. J Finance 57:2223–2261
- 9 Fournié E, Lasry JM, Lebuchoux J, Lions PL, Touzi N (1999) Applications of Malliavin calculus to Monte Carlo methods in finance. Finance Stoch 3(4):391-412
- 10 Hatemi-J A, Hacker S (2005) An alternative method to test for contagion with an application to the Asian financial crisis. Appl Financ Econ Lett 1(6):343–347
- 11 Lillo F, Mantenga F (2003) Power-law relaxation in a complex system: Omori law

- after a financial market crash. Phys Rev E 016119
- 12 McCauley J (2004) The dynamics of markets: econophysics and finance. Cambridge University Press, Cambridge
- 13 Nualart D (1995) The Malliavin calculus and related topics. Springer, Berlin
- 14 Oksendal B (1996) An introduction to malliavin calculus with applications to economics. Working paper 3, Institute of finance and management science, Norwegian school of economics and business administration
- 15 Savit R (1989) Nonlinearities and chaotic effects in options prices. J Futures Mark 9(6):507–518
- 16 Sornette D (2003) Why stock markets crash: critical events in complex financial markets. Princeton University Press, Princeton, NJ
- 17 Tvedt J (1998) Valuation of European futures options in the bifex market. J Futures Mark 18:167–175

### **Author information**

Authors and Affiliations

Department of Mathematical Sciences, UAE
University, Al-Ain, 17551, United Arab
Emirates

Youssef El-Khatib

Department of Economics and Finance, UAE
University, Al-Ain, 17555, United Arab
Emirates

Abdulnasser Hatemi-J

Corresponding author

Correspondence to Youssef El-Khatib.

### **Editor** information

**Editors and Affiliations** 

International Association of Engineers, Unit 1, 1/F, 37-39 Hung To Road, Hong Kong, China

Sio-long Ao

School of Engineering, Applied Mathematics and Computing, Cranfield University, College Road, Cranfield, MK43 OAL, Bedfordshire, United Kingdom

Len Gelman

Rights and permissions

Reprints and permissions

## Copyright information

© 2013 Springer Science+Business Media, LLC

## About this chapter

### Cite this chapter

El-Khatib, Y., Hatemi-J, A. (2013). Computations of Price Sensitivities After a Financial Market Crash. In: Ao, SI., Gelman, L. (eds) Electrical Engineering and Intelligent Systems. Lecture Notes in Electrical Engineering, vol 130. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-2317-1\_20

### <u>.RIS </u> <u>.ENW </u> <u>.BIB </u> <u>↓</u>

DOI Published Publisher Name https://doi.org/102 May 2012 Springer, New 0.1007/978-1- York, NY 4614-2317-

1\_20

Print ISBN Online ISBN eBook Packages 978-1-4614- 978-1-4614- Engineering 2316-4 2317-1 Engineering (RO)

Publish with us

Policies and ethics

## Search

Search by keyword or author

# Navigation

Find a journal

Q

Publish with us		
Track your research		